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## Biochemical analysis of *Achyranthes aspera* used in fever and diabetes in Santal Parganas, Jharkhand

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**Abstract-** In the present investigation phytochemical studies of *Achyranthes aspera* Linn. has been done. It is an important medicinal herb which is used for the treatment of diabetes in the tribal regions of Santal Parganas. Besides diabetes, the plant is very much used by the tribal people for the treatment of syphilis leucorrhea, bronchitis asthma and liver ailments. Perusal of the data of Table 1. It is clear that out of 20 amino acids only nine could be detected from the plant under study. They were lysine, L-histidine, L-arginine, cysteine L-glutamine, Glycine, L-glutamic acid, L-valine and DL- tryptophane. In the above list it is clear that at least 4 essential amino acids are present. They were L-arginine, lysine, lysine, L-valine and DL- tryptophan. 10 essential amino acids are necessary for proper growth and their metabolic functions in human beings among which 4 are present in this plant and rest three are non-essential amino acids. Non-amino acids have curative effect on diseased persons perhaps due to presence of these non-essential amino acids this plant is ethnobotanically important.

**Keywords :** *Achyranthes aspera*, ethnobotanically significant plant, tribal, santal parganas

### INTRODUCTION

Santal Parganas forests are rich in indigenous plants and they are still intact due to the dependence of tribal people on herbal medicines for the treatment of various diseases. For the present investigation *Achyranthes aspera* Linn, was selected for study. The plant was collected from Inarabaran forest of Deoghar district in the month of ecological distributions. The plant is rampantly used by the tribal people of Santal Parganas for treatment of diabetes. Besides diabetes, the plants are very much used for the treatment of syphilis leucorrhea, bronchitis, asthma and liver ailments by the local vaidyas.

### MATERIAL AND METHODS

The plants were collected from different localities of Inarabaran forest during the month of October-November.

Simple chromatographic techniques were employed for detection of free and bound amino and present in the plants following the methodology suggested by Harborne (1973). The R<sub>f</sub> values were worked out on the basis of following formula.

$$R = \frac{\text{Distance travelled by solute}}{\text{Distance traveled by solvent}}$$

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The various amino acids were identified by camping coloration of the spots and also by Rf values of the known amino acids from the index. A set of 24 amino acids by Laco of U.K. was used for index purpose. On the basis of visual observation concentration of different amino acids were noted in the table as 4", 3", 2", 1" and 'tr (trace). To avoid any error in the analysis of test plants (T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>) were taken into consideration *A. aspera* were collected from three different places of the forest of Inarabaran during the month of October-November.

## RESULTS AND DISCUSSION

*Achyranthes aspera* is a plant of the family Amarantaceae. It is branched, prostrate on the ground, 4 to 15' long with thinly of densely silk leaves. Leaves are broadly elliptical 015, flowers are sub rotate upto 2" long. One tea spoon dried flowers and leaves are given to diabetic patients in the morning for lowering blood sugar level. One tribal patient of the Inarabaran locality told us that in one week only, this herbal medicine lowered my sugar level from 390 to 152pp. The data of amino acids analysis of *A. aspera* is given in Table 1. Perusa of the data of Table 1. it is clear out of 24 amino acids only nine could be detected from the plants under study. They were Lysine. L-arginine. Cyster L-valine Tryos, DL-tryptophan etc. among which sstem valine nad DI-aryptophan could be detcted in higher cncentraton Re. (3+) while lys ne. angenine, glycine and DL-tryptopnan were present in both the forms i.e. "free form and gauche form while the rest three were restricted to free form only.

The traditions of tribals had received an excellent help from a Bengali press about 125 years ago and several books and articles published. In 1887 the famous book "Horkoren Mare hapramka Reak Katha" was published. An English writer Bodding translated the book in 1942<sup>2</sup> and with great insight divided the book into several chapters. One of the chapters was "The studies in Santal medicines and connected folklore". This chapter mentions about the medicinal herbs used by tribals for the treatment of diseases.

In the present investigation biochemical analysis of tribal medicinal herb used for the treatment of diabetes has been undertaken. *A. aspera* is a very important indigenous plant of tribal community used for the treatment of sphilis, leucorrhea bronchitis, asthame and live

ailments mediator in many physiological reactions.<sup>3</sup> This is the first scientific study of this plant of tribal folklore the earlier, other plants of tribal folklore were studied for amino acids and protein contents. In this regard, mention may be made to the works of Anwar and Reddy (1974)<sup>4</sup>, Mohammad and Raghubanshi (1981)<sup>5</sup>, Gupta *et al.* (1984)<sup>6</sup> and Patridge (1991)<sup>7</sup>.

Perusal of the Table 1 it is clear that in this plant put of 10 essential amino acids 4 types were present. They were argentine, lysine, valine and tryptophan. Ten essential amino acids are most important for human growth and proper metabolic functions.<sup>8</sup> Perhaps, due to the presence of these four essential acids in this plant, the plant is useful as medicine in various diseases.

Rest three amino acids are non-essential amino acids present in this plant, these were cysteine, tyrosine and glycine Non-essential amino acids specially cysteine, glycine, glutaric acid, DL metheonine a and omithine have profound curative effect on diseases persons.<sup>9</sup> Perhaps, due to the presence of four essential a three non-essential ammo acids in *A. aspera*, this plant is ethnobotanically important. Cystein is a non-essential sulphur containing amino acid and its presence the diet decreases the metheonine percentage in the body.<sup>9</sup>

The metabolic role of this amino acid is responsible for the growth of thick hairs, curative effect in live ailments, in pancreases ailments and in tanned skin.<sup>8</sup> Besides this it is a rich source in human diet.<sup>9</sup> Excess of cystein in human can also cause "amino aciduna".<sup>10</sup> Sinha (1988)<sup>11</sup> also reported its use in curing the burning sensation during discharge of urine.

In the past many biochemists, cytogeneticist and pharmacologists were undertaken phyto-chemical analysis of crop plants mainly for the better quality and higher yield. Mention may be made in this regards to the work of Boge (1960),<sup>12</sup> Josh and Srivastava (1976).<sup>13</sup> In the present investigation analysis of amine acids has been incorporated on the fact the amino acids represent (available reserve material which can be utilized for direct incorporation into essential proteins as a source of energy.

**Table 1. Amino acids present in th leaf extract of *A. aspera* collected from Inarabaran of Deoghar district**

Amino Acids	Rf Value	Concentration of Visula observation							
		Free form				Bound form			
		T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	Mean
Lysine	0.04	2+	2+	2+	2+	+	+	+	+
L-histicine	0.06	2+	2	2	2+	-	-	-	-
Asparation acid	0.09	-	-	-	-	-	-	-	-
L-argenine	0.12	3+	2+	3+	3-	-	-	-	-
Cystcine	0.16	2+	+	2+	2+	-	-	-	-
DL-Asparagine	0.18	-	-	-	-	-	-	-	-
Proline	0.21	-	-	-	-	-	-	-	-
L-glutamine	0.23	3+	3+	+	3+	tr	tr	+tr	+tr
Scrine	0.24	-	-	-	-	-	-	-	-
Hyaroxy proline	0.26	-	-	-	-	-	-	-	-
DL-threonine	0.28	2+	+	2+	2+	-	-	-	-
Glycine	0.31	3+	+	3+	3+	+	+	+	+
L-glutamic acid	0.33	-	-	-	-	-	-	-	-
Ornthine	0.34	-	-	-	-	-	-	-	-
Dihydroxy-Pnenylamine	0.37	-	-	-	-	-	-	-	-
DL-alanine	0.45	-	-	-	-	-	-	-	-
DL-methonine	0.49	-	-	-	-	-	-	-	-
Amino-latyric acid	0.56	-	-	-	-	-	-	-	-
L-valine	0.61	3+	2+		2+	-	-	-	-
Trycsine	0.63	-	-	-	-	-	-	-	-
Phenylanne	0.67	-	-	-	-	-	-	-	-
DL-tryptophan	0.71	2-	2+	2+	2+	-	-	-	-
Iso-leucine	0.76	-	-	-	-	-	-	-	-
L-leucine	0.8	-	-	-	-	-	-	-	-

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